

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 28 OCT 2005

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Applicant's or agent's file reference E-2291/04		FOR FURTHER ACTION		See Form PCT/IPEA416
International application No. PCT/EP2004/051597		International filing date (day/month/year) 23.07.2004	Priority date (day/month/year) 25.07.2003	
International Patent Classification (IPC) or national classification and IPC B41F31/02, B41F9/06				
Applicant PERCIVALLE SPECIAL CONVERTING S.A.S. DI ...et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 6 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 03.05.2005		Date of completion of this report 31.10.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016		Authorized Officer Duquénoy, A Telephone No. +31 70 340-2065		



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/051597

Box No. 1 Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1, 3-14	as originally filed
2	filed with telefax on 03.05.2005

Claims, Numbers

1-20	filed with telefax on 03.05.2005
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Drawings, Sheets

1/5-5/5	as originally filed
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- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☒ the description, pages 3
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/051597

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-20
	No: Claims	
Inventive step (IS)	Yes: Claims	1-20
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-20
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1 Reference is made to the following documents:

- D1 : US 4 945 832 A (ODOM JIMMIE L) 7 August 1990 (1990-08-07)
- D2 : EP 0 941 845 A (FISCHER &; KRECKE GMBH &; CO) 15 September 1999
(1999-09-15)
- D3 : US 4 590 855 A (LAVALLIERE WAYNE ET AL) 27 May 1986 (1986-05-27)
- D4 : EP 0 688 670 A (FIT GROUP INC) 27 December 1995 (1995-12-27)
- D5 : DE 42 41 792 A (GORTER CORNELIS) 16 June 1994 (1994-06-16)
- D6 : US 2 377 110 A (SMITH HERMAN A) 29 May 1945 (1945-05-29)
- D7 : GB 604 568 A (GOSS PRINTING PRESS CO LTD) 6 July 1948 (1948-07-06)

2 INDEPENDENT CLAIM 1

- 2.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):
an inking and doctor unit (figure 2) for a rotogravure print and spread cylinder,
comprising a casing (52); a doctor assembly (64,67,70,73) including a doctor (73)
fitted to a doctor carrier (64); and an inking chamber (54) bounded by a concave
inner surface (figure 2) of the casing (52) and at least partly by the doctor assembly
(73); the casing (52) and the doctor assembly (73) forming a box body (col. 7, lines
24-29) closed except for one side engaging in use a print cylinder (3); **wherein** the
doctor (73) is mounted to lie flat with respect to a lateral surface (5) of the print
cylinder, when the box body engages the print cylinder (3).
- 2.2 The subject-matter of claim 1 differs from this known inking and doctor unit in that
the doctor carrier comprises a **rocking support** rotating about a regulating axis
parallel in use to an axis of rotation of the print cylinder; and a **slide integral with the
doctor and which slides on the support**.
- 2.3 The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

2.4 The problem to be solved by the present invention may be regarded as improving the position/angle and pressure adjustment exerted by the doctor.

2.5 The solution to the problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The features "the doctor carrier comprises a **rocking support** rotating about a regulating axis parallel in use to an axis of rotation of the print cylinder; and a **slide integral with the doctor and which slides on the support**" is not disclosed in any document of the prior art.

Even if the skilled person would like to adjust the angle of the doctor, he would design comprising a doctor assembly comprising only a doctor with a rocking support. The skilled person would have no idea to design an intermediary element (a slide between the doctor and the rocking support) that could slide on the rocking support.

3 DEPENDENT CLAIMS 2-20

3.1 Claims 2-20 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

4 ARTICLE 19 PCT

4.1 The page 3, filed with the fax of 03-05-05 does not meet the requirements of the PCT with respect to added subject-matter. The paragraph added discloses features ("print cylinders having different developments i.e. diameters", "without requiring substitution of other components", etc..) that go beyond the originally filed description.

4.2 Therefore, the page 3 has not been taken into account for the international preliminary report.

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/EP2004/051597

Known rotogravure printing presses have various drawbacks. In particular, precisely on account of the high rotation speed of the print cylinder, part of the ink withdrawn during immersion inside the ink tank is spun off the cylinder surface and splashed onto surrounding components. Moreover, to leave enough room for the doctor and doctor carrier assembly, the ink tank cannot be located right next to the pressure roller, so that the inked portion of the print cylinder and the potential ink spin-off arc are fairly large. Ink splash obviously makes it necessary to clean all the components surrounding the print cylinder at the end of each printing cycle, especially when the type of ink being used is changed. And the cleaning work involved is a major handicap when making numerous short runs; in which case, overall downtime seriously affects efficiency in terms of utilization. Another drawback lies in the print cylinder remaining in contact with the surrounding air over the entire arc between the pressure roller and the ink tank, so that leftover ink not transferred to the strip material tends to dry and cake, thus preventing optimum inking of the cylinder surface, and seriously affecting printing quality.

A number of solutions are known (for example from US-A-4945832 and GB-A-604568) wherein the doctor and the doctor carrier assembly are closed in a box body facing the print cylinder; these solutions are however unsuitable to be used with print cylinder having different diameters, so requiring a replacement of the inking and doctor unit for operation with different size print cylinders.

30 DISCLOSURE OF THE INVENTION

It is an object of the present invention to provide an inking and doctor unit for a rotogravure print and spread assembly, designed to eliminate the aforementioned drawbacks.

35 According to the present invention, there is provided an inking and doctor unit for a rotogravure

CLAIMS

- 1) An inking and doctor unit (3) for a rotogravure print and spread cylinder, comprising a casing (13); a doctor assembly (14) including a doctor (24) fitted to a doctor carrier (25); and an inking chamber (15) bounded by a concave inner surface (13a) of the casing (13) and at least partly by the doctor assembly (14); the casing (13) and the doctor assembly (14) forming a box body (18) closed except for one side engaging in use a print cylinder (2); characterized in that the doctor (24) is mounted to lie flat with respect to a lateral surface (11) of the print cylinder (2), when the box body (18) engages the print cylinder (2); and in that the doctor carrier (25) comprises a rocking support (27) rotating about a regulating axis (C) parallel in use to an axis of rotation (A) of the print cylinder (2); and a slide (28) integral with the doctor (24) and which slides on the support (27).
- 2) A unit as claimed in Claim 1, characterized by comprising first sealing means (21, 21a, 22, 22a; 19a, 20a) for hermetic connection to the print cylinder (2).
- 3) A unit as claimed in Claim 2, characterized in that the first sealing means (21, 21a, 22, 22a) are flat-surface sealing means designed to engage opposite end surfaces (10) of the print cylinder (2).
- 4) A unit as claimed in Claim 3, characterized in that said first sealing means (21, 21a, 22, 22a) comprise

a first and a second plate (21, 22) fitted at opposite ends of the casing (13) and having respective sealing edges (21a, 22a) facing each other and arranged to slide on respective said end surfaces (10) when the box body
5 (18) engages the print cylinder (2).

5) A unit as claimed in Claim 4, characterized in that the first and second plate (21, 22) are movable with respect to the casing (13); and by comprising elastic means (21b, 22b; 50) associated with the first and second
10 plate (21, 22) to press the first and second plate (21, 22) against respective said end surfaces (10) when the box body (18) engages the print cylinder (2).

6) A unit as claimed in Claim 2, characterized in that the first sealing means (19a, 20a) are radial
15 sealing means shaped to engage the lateral surface (11) of the print cylinder (2).

7) A unit as claimed in Claim 6, characterized in that the first sealing means (19a, 20a) are carried by the casing (13), at opposite ends of the doctor assembly
20 (14), and comprise sealing edges (19a, 20a) of the casing (13) shaped to slide on the lateral surface (11) of the print cylinder (2) along at least a predetermined arc, when the box body (18) engages the print cylinder (2).

8) A unit as claimed in any one of the foregoing
25 Claims, characterized by comprising second sealing means (34, 35, 36) between the doctor assembly (14) and the casing (13).

9) A unit as claimed in Claim 8, characterized in

that the second sealing means (34, 35, 36) comprise seals (34, 35) located at opposite ends of the doctor assembly (14), flush with a first and second lateral wall (19, 20) respectively of the casing (13).

5 10) A unit as claimed in Claim 9, characterized in that the second sealing means (34, 35, 36) comprise pads (36) made of low-friction material, incorporated in the first and second lateral wall (19, 20) of the casing (13), and located at opposite ends of the doctor assembly
10 (14); and pressure means (37, 38) for pressing the pads (36) against the opposite ends of the doctor assembly (14).

11) A unit as claimed in any one of the foregoing Claims, characterized by comprising third sealing means
15 (32, 33) between a sealing surface (28a) of the doctor assembly (14) extending continuously along the whole width of the doctor assembly (14), and an edge (13b) of the casing (13) adjacent to the sealing surface (28a).

12) A unit as claimed in any one of the foregoing
20 Claims, characterized in that the doctor (24) is fitted to the doctor carrier (25) for resting in use on the lateral surface (11) of the print cylinder (2) along a doctor line (R); the doctor (24) forming an acute angle with a plane tangent to the lateral surface (11) of the
25 print cylinder (2) along the doctor line (R), on the ink (12) feed side.

13) A unit as claimed in any one of the foregoing Claims, characterized by comprising actuating members

(30) for moving the slide (28) with respect to the support (27a; 13c).

14) A unit as claimed in any one of the foregoing Claims, characterized by comprising an inking roller (16) housed inside the inking chamber (15) with an axis (B) of rotation parallel to the axis of rotation (A) of the print cylinder (2) for pressing ink (12) collected inside the inking chamber (15) against the lateral surface (11) of the print cylinder (2).

10 15) A unit as claimed in any one of the foregoing Claims, characterized by comprising a hood (17) designed to define, in use, a wetting chamber (39) about a portion of the lateral surface (11) of the print cylinder (2) extending substantially between a print area (8) and the inking chamber (15).

16) A unit as claimed in Claim 15, characterized by comprising first and second feed means (6, 7) for feeding a wetting fluid and a cleaning fluid respectively into the hood (17).

20 17) A rotogravure print and spread assembly (1) comprising a print cylinder (2) having an axis of rotation (A); characterized by comprising an inking and doctor unit (3) as claimed in any one of Claims 1 to 16.

18) An assembly as claimed in Claim 17, characterized by comprising actuating means (4) for adjusting the relative position of the inking and doctor unit (3) with respect to the print cylinder (2).

19) An assembly as claimed in Claim 18,

characterized in that the actuating means (4) comprise rotary actuating means (40, 45) for rotating the inking and doctor unit (3) about the axis of rotation (A) of the print cylinder (2).

- 5 20) An assembly as claimed in Claim 18 or 19, characterized in that the actuating means (4) comprise first translatable actuating means (41) for translating the inking and doctor unit (3) in a first direction substantially perpendicular to the axis of rotation (A);
- 10 and second translatable actuating means (4) for translating the inking and doctor unit (3) in a second direction substantially parallel to the axis of rotation (A).